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(54) Title: METHODS FOR FRAGMENTATION AND LABELING OF NUCLEIC ACIDS

(57) Abstract: The invention provides methods, compositions, and kits for fragmentation and labeling of nucleic acids. More particularly, the invention relates to methods for fragmentation of nucleic acids to produce fragments with 3' end hydroxyl groups within a desired size range. In methods of the invention, nucleic acids are fragmented at abasic sites to produce fragments with blocked 3' ends. The 3' ends are unblocked to produce polynucleotide fragments with hydroxyl groups at their 3' ends. Methods, kits, and compositions for carrying out fragmentation of a polynucleotide template in a single reaction mixture to yield fragments with 3'-hydroxyl ends within the desired size range are disclosed.

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/15409

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: C12Q 1/68( 2006.01);C12P 19/34( 2006.01);C12N 9/00( 2006.01);G01N 33/00( 2006.01);C07H 21/02( 2006.01);21/04( 2006.01);21/00( 2006.01)

USPC: 435/6,91.1,183;436/94;536/23.1,24.3,24.33,25.3,25.32

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6, 91.1, 183; 436/94; 536/23.1, 24.3, 24.33, 25.3, 25.32

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/0005614 (KURN et al.) 08 Jan. 2004 (08.01.2004), [0037], [0046]-[0048], [0071], [0073], [0075], [0098], [0136], [0137],[0155], [0305], [0395], [0397], claims 1-11, 15-17, 20, 23-29, 35-37, 40, 44, 47-49, 51, 55-57, 60-61, 65, and 70-78.	1-7,14-42,44-63, 65-67 and 73-74
Y	5,573,913 A, (ROSEMEYER et al.) 12 Nov 1996 (12.11.1996), column 1, lines 6-10; column 2, lines 63-67; column 3, lines 1-2, 26-32, and 45-49; column 4, lines 23-43, 44-49, 53-54, and 62-67; column 5, lines 4-9, 23-31; column 6, lines 66-67; column 7, lines 1-3; column 10, lines 29-34; column 16, claims 14-15.	8-13, 43, 64 and 68-72

<input type="checkbox"/> Further documents are listed in the continuation of Box C.		<input type="checkbox"/> See patent family annex.	
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>		<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>	
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<p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US</p> <p>Commissioner for Patents</p> <p>P.O. Box 1450</p> <p>Alexandria, Virginia 22313-1450</p> <p>Facsimile No. (571) 273-3201</p>		<p>Authorized officer</p> <p>Joyce Tung</p> <p>Telephone No. 571 (272)0700</p>	

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Continuation of B. FIELDS SEARCHED Item 3:

WEST and STN searched.

search terms: label, biotin, dideoxynucleotide, terminal deoxynucleotidyl transferase, dimethylethylenediamine, exonuclease